SIMPLE MATHEMATIC FOR PRESCHOOL USING AUGMENTED REALITY

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ABSTARK

Simple Mathematic adalah alat yang direkakan untuk pelajar prasekolah untuk membantu mereka dalam mempelajari subjek matematik dengan cara yang lebih menarik dengan menggunakan teknologi realiti bertambah. Alat ini juga membantu para guru untuk mengajar pelajar menjadi lebih mudah difahami dengan menarik minat dan penyertaan pelajar. Augmented Reality (AR) adalah objek maya 3D yang diintegrasikan ke dalam persekitaran sebenar 3D dalam masa nyata. Teknologi AR dapat membantu pelajar meningkatkan pembelajaran mereka dengan lebih cepat dalam persekitaran yang lebih menyeronokkan. Projek ini dijalankan berdasarkan model ADDIE yang merangkumi proses analisis, reka bentuk, pembangunan dan penilaian. Setiap proses dinilai menggunakan penilaian formatif. Pada akhir projek penilaian singkatan mengenai fungsi dan interaktiviti sistem untuk mengesahkan prestasi alat pembelajaran.

ABSTRACT

Simple Mathematic is a tool that is developed for preschool students to help them in learning mathematic subject in more interesting way using augmented reality technology. This tool also helps teachers to teach the students to become more understandable by getting the students' interest and participation. Augmented Reality (AR) is a 3D virtual objects that are integrated into 3D real environment in real time. AR technology can help the students to improve their learning faster in a more fun environment. This project is conducted based on ADDIE model that include the process of analysis, design, development and evaluation. Each process is evaluated using the formative evaluation. At the end of the project a summative evaluation on the functions and interactivity of the system to validate the performance of the learning tool.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

The Simple Mathematic for Preschool Kids using Augmented Reality is developed the purpose of helping preschool kids to learn Mathematic subject in more interesting way. This tool can help teachers to teach these kids to become more understandable in learning mathematic subject. Augmented Reality (AR) are not something unfamiliar in education nowadays. However, the usage of AR for preschool is rarely used. Then, the development of this tools will be used for preschool. The main purpose of this courseware is to help the school teachers to teach simple Mathematic subject the kids in their learning process. Teacher used their own books and 2D flashcard to make the kids understand the learning modules by using the conventional techniques.

1.1 Introduction to Preschool Education in Malaysia

The Ministry of Education (MOE) has started in implementing the annex preschool program as a project based on the decision made by the Cabinet on 18 December 1991 to create preschool in 1992. Meantime, the Cabinet meeting agreed that the MOE could continue to expand the preschool from 2002 on 6 June 2001. Since then, the preschool program has been conducted in line with the existing policies.

The Education Act 1996 provides for preschool education, primary education, secondary education, post-secondary and higher education in the National Education System. MOE is responsible to give serious attention to the development of preschool including the establishment of kindergartens, the minister's power to establish and maintain kindergartens, preschool curriculum, medium of instruction and teaching of Islamic studies.

There are a few objectives of preschools in Malaysia. Firstly, having a positive personal traits, character and self-concept to be a patriotic citizen. Then, using Malay correctly and developing language and communication skills and also using English in daily life based in line with its status as the second language. Last but not least, having cognitive skills to think and solve problems also one of the objective of preschools in Malaysia.

1.2 Introduction to Augmented Reality

Augmented Reality (AR) is a 3D virtual objects that are integrated into 3D real environment in real time (R.T. Azuma, 1997). It offers a different set of affordances from the various technological interventions. It is mean that AR will be used differently from other technologies when it is applied in education.

Firstly, AR requires the combination of virtual elements and real environment. Milgram and Kishino (1994) made the conceptual that AR as part of a virtuality continuum. Virtuality environment is the purely real environment on one side while the other side is the purely virtual environment. AR sits between these two extremes.

Secondly, AR requires three-dimensional registration such that the virtual element are aligned to the real environment. Next, the third AR requirement is real-time interactivity with the virtual elements. Thus, the virtual elements must be like real element in the real environment.

Augmented Reality is a next generation interface that affords a different wat of interaction with the information. This interaction used to develop better learning experiences.

1.3 Project Background

Learning is something that is very important as a medium to gain knowledge. However, there are lot of way of learning and also teaching. One of the way is by using Augmented Reality (AR). AR is a type of virtual reality that virtualizing the world's environment into computer. An augmented reality system developed the combination of the real scene viewed by the user and a virtual scene generated by the computer that augments the scene with additional information. The virtual scene is created by the computer that designed for increasing the user's sensory perception of the virtual world they are seeing or interacting with it. Therefore, Simple Mathematic tool are designed using Augmented Reality that focused on preschool kids.

AR technology can help them to improve their learning of mathematic subject faster. AR can be implemented in the school curriculum and key stages to enhance the interactive learning environment. Every preschools have their own way to teach kids. Kids are love to play more than learn at their age. Therefore, AR is used because of the interesting way of using it.

AR systems have been widely demonstrated in different research area and have had much success in gaining a good factor from those who have experience it (Billinghurst, 2002).

The best way to help preschool kids to understand Mathematic subject, they can start using Augmented Reality because it can make more realistic and fun. They can learn by using book where inside the book, they can used symbol card because this is one of the alternative ways that can help them. This card can be created in multiple colors, music, and animation. Furthermore, this application can attract them in their learning.

1.4 Problem Statement

The method of learning simple Mathematic subject for preschool kids by using non-interactive tools in learning have raising a lot of problems such as kids do not interest to learn. The problem are:

1.3.1 Preschool kids slow in learning the Mathematic subject.

1.3.2 Augmented Reality technologies not been exposed to preschool kids in their learning.

1.3.3 Preschool kids do not learn Mathematic subject in interesting way.

1.5 Objective

Based on the problems statement, the objectives of this project are:

i) To integrate Augmented Reality approach in learning simple Mathematic.

ii) To develop the teaching and learning tools for preschool kids.

iii) To test the proposed tools of simple Mathematic for preschool kids at range age 3 to 5 years old by assessing the kids through exercise in tools.

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